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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/929,188 | 08/14/2001 | Christopher D.W. Jones | JONES 2-21-60 | 1211 |

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EXAMINER

PHAM, HOAI V

ART UNIT PAPER NUMBER

2814

DATE MAILED: 12/16/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/929,188

Applicant(s)

JONES ET AL.

Examiner

Hoai V Pham

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 03 October 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 15-22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 15-22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 22 is objected as being in improper form because the dependent claim 22 can not depend on itself.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claim 21 is rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The usage of "copper alloy" for the first and second electrodes and the first conductive layer is not described in the specification.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claims 15-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jun et al. [U.S. Pat. 5,393,373] previously applied, in view of Shih et al. [U.S. Pat. 6,436,787] newly cited.

With respect to claims 15, 18-20, Jun et al. (figs. 8a-8e, cols. 6-7) discloses an interdigitated capacitor, comprising:

first electrodes (26) located on and interconnected by a first conductive layer (24);

a dielectric layer (16) located over and between the first electrodes and on the first conductive layer; and

an electrode layer (17) located on the dielectric layer and over and between the first electrodes to form interconnected second electrodes over and between the first electrodes.

With respect to claims 19-20, Jun et al. discloses that the first electrodes, the first conductive layer, and the electrode layer are comprised of substantially the same material (see col. 7, lines 1-27).

Jun et al. does not disclose that: **a)** the first conductive layer, the first electrode, and the second electrode are made of a metal (copper); and **b)** the dielectric layer is made of high-K dielectric (e.g. barium strontium titanate). However, it would have been known in the art that **a)** the metal (copper) can be used to form electrodes & conductive layer for the capacitor, and **b)** the high-K dielectric material (e.g. barium strontium titanate) can be used to form a capacitor dielectric. See Shih et al. as an evidence which shows that the first conductive layer (16), the first electrode (24) and the second electrode (34) are made of the metal (copper), and the dielectric layer (28) is made of high-K dielectric (e.g. barium strontium titanate) (see fig. 3, col. 2, lines 46-47, col. 3, lines 5-35). Therefore, it would have been obvious to the skilled in the art to use the metal (copper) for the first conductive layer, the first electrode and the second electrode in the capacitor of Jun et al to increase conductivity. It would have been also obvious to the skilled in the art to use the high-K dielectric (e.g. barium strontium titanate) for the capacitor dielectric in the capacitor of Jun et al in order to increase capacitance of the capacitor. Note that selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

With respect to claim 16, Jun et al does not show that: a first barrier layer located between the first electrodes and the dielectric layer; and a second barrier layer

located between the dielectric layer and the second electrodes. However, Shih et al. shows the first barrier layer (26) located between the first electrodes (24) and the dielectric layer (28), and a second barrier layer (30) located between the dielectric layer and the second electrodes (34) to prevent copper ions from diffusing into the dielectric layer thereby reducing the leakage current (see fig. 3, col. 3, lines 10-46). Therefore, it would have been obvious to the skilled in the art to use the first and second barrier layers as being claimed in the device of Jun et al. in view of Shih et al. in order to prevent copper ions from diffusing into the dielectric layer thereby reducing the leakage current.

With respect to claim 17, Jun et al. does not teach the exact an aspect ratio range of their first electrode, as claimed by Applicant. However, Jun et al. shows that the aspect ratio range of the first electrode can be controlled (see the abstract). Therefore, the aspect ratio range would have been obvious to an ordinary artisan practicing the invention because, absent evidence of disclosure of criticality for the range giving unexpected results, it is not inventive to discover optimal or workable ranges by routine experimentation. *In re Aller*, 220 F.2d 454, 105 USPQ 233, 235 (CCPA 1955).

7. Claim 22, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Jun et al. [U.S. Pat. 5,393,373] previously applied, and Shih et al. [U.S. Pat. 6,436,787] newly cited, as applied to claims 15-21 above, and further in view of Thakur et al. [U.S. Pat. 6,150,706] previously applied.

Jun et al in view of Shih et al discloses all the limitations as being claimed above except teaching the high-k dielectric layer comprising tantalum pentoxide. However, Thakur et al. discloses that the high-k dielectric layer (14) comprising tantalum pentoxide can be used for the capacitor dielectric (see fig. 1, col. 2, lines 65-67). Therefore, it would have been obvious to the skilled in the art to use the tantalum pentoxide for the capacitor dielectric in the capacitor of Jun et al in view of Shih et al to increase capacitance of the capacitor. The selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945).

Response to Arguments

8. Applicant's arguments with respect to claims 15-22 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not

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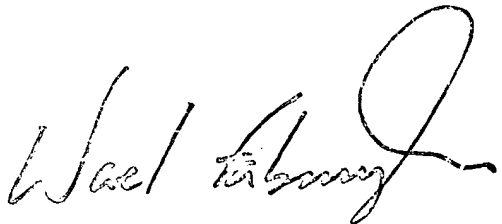
mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hoai V Pham whose telephone number is 703-308-6173. The examiner can normally be reached on 6:30A.M. - 6:00P.M..

12. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M. Fahmy can be reached on 703-308-4918. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7724 for After Final communications.

13. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

HP
Hoai Pham
December 10, 2002


SUPERVISORY PRIMARY EXAMINER
TECHNOLOGY CENTER 2800